Honors Geometry Midterm Review Proof Name Key

Use figure 1 for #1,2, 3, & 4.

1. Given: $m\angle SRT = m\angle STR$; $m\angle 3 = m\angle 4$
   Prove: $m\angle 1 = m\angle 2$

Statements	Reasons
1. $m\angle SRT = m\angle STR$ $m\angle 3 = m\angle 4$	1. Given
2. $m\angle SRT = m\angle 3 + m\angle 1$ $m\angle STR = m\angle 4 + m\angle 2$	2. Angle Addition Postulate
3. $m\angle 3 + m\angle 1 = m\angle 4 + m\angle 2$	3. Substitution
4. $m\angle 1 = m\angle 2$	4. Subtraction Prop. of =

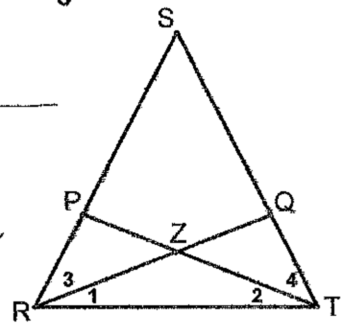
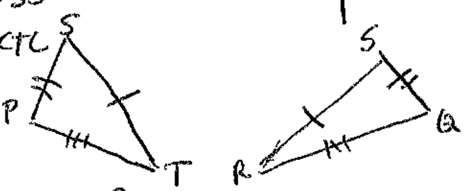


Figure 1

2. Given: RP = QT; PS = QS
   Prove: RS = TS

Statements	Reasons
1. RP = QT ; PS = QS	1. Given
2. RP + SP = RS QT + QS = TS	2. Segment Addition Postulate
3. RP + SP = QT + QS	3. Addition Prop of =
4. RS = TS	4. Substitution

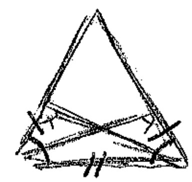
#3
11. $\triangle SPT \cong \triangle SQR$ SSS
12. $\angle TPS \cong \angle RQS$ CPCTC



3. Given: $\overline{RS} \cong \overline{TS}$; $\overline{PS} \cong \overline{QS}$
   Prove: $\angle TPS \cong \angle RQS$

Statements	Reasons
1. $\overline{RS} \cong \overline{TS}$; $\overline{PS} \cong \overline{QS}$	1. Given
A 2. $\angle SRT \cong \angle STR$	2. Base $\angle$ Theorem
S 3. $\overline{RT} \cong \overline{RT}$	3. Reflexive Prop of $\cong$
4. RS = TS ; PS = QS	4. def of $\cong$
5 RS = RP + PS TS = TQ + QS	5. Segment Add. Post.
6. RP + PS = TQ + QS	6. Substitution
7. RP = TQ	7. Subtraction Prop of =
S 8. $\overline{RP} \cong \overline{TQ}$	8. def of $\cong$
9 $\triangle RPT \cong \triangle TQR$	9. SAS
10 $\overline{PT} \cong \overline{QR}$	10 CPCTC

See above



4. Given: $\overline{RS} \cong \overline{TS}$; $\overline{RP} \cong \overline{TQ}$
   Prove: $\overline{PZ} \cong \overline{QZ}$

Statements	Reasons
1. $\overline{RS} \cong \overline{TS}$; $\overline{RP} \cong \overline{TQ}$	1. Given
2 $\angle SRT \cong \angle STR$	2. Base $\angle$ Theorem
3. $\overline{RT} \cong \overline{RT}$	3. Reflexive Prop of $\cong$
4. $\triangle PRT \cong \triangle QTR$	4. SAS
5. $\angle RPZ \cong \angle TQZ$	5. CPCTC
6. $\angle PZR$ and $\angle QZT$ are vertical $\angle$s	6. def of vertical $\angle$s
7. $\triangle PZR \cong \triangle QZT$	7 AAS
8. $\overline{PZ} \cong \overline{QZ}$	8. CPCTC

5. Given: $\overline{AB} \cong \overline{CD}$; $\overline{AB} \parallel \overline{CD}$
Prove: $\overline{AD} \cong \overline{CB}$

Statements	Reasons
1. $\overline{AB} \cong \overline{CD}$; $\overline{AB} \parallel \overline{CD}$	1. Given
2. $\angle ABD \cong \angle CDB$	2. Alternate Interior ∠s Theorem
3. $\overline{DB} \cong \overline{DB}$	3. Reflexive Prop of ≅
4. $\triangle ABD \cong \triangle CDB$	4. SAS
5. $\overline{AD} \cong \overline{CB}$	5. CPCTC

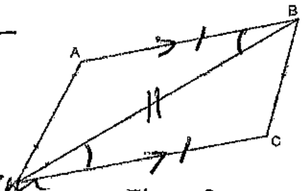


Figure 2

6. Given: $\overline{AC}$ bisects $\angle BAD$, $\angle 1 \cong \angle 3$
Prove: $\overline{BC} \parallel \overline{AD}$

Statements	Reasons
1. $\overline{AC}$ bisects $\angle BAD$, $\angle 1 \cong \angle 3$	1. Given
2. $m\angle 1 = m\angle 2$	2. def of ∠ bisector
3. $m\angle 1 = m\angle 3$	3. def of ≅
4. $m\angle 2 = m\angle 3$	4. substitution
5. $\overline{BC} \parallel \overline{AD}$	5. Alternate Interior ∠s Converse

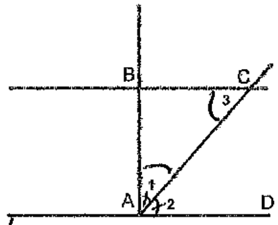


Figure 3

7. Given: $\overline{AC}$ is a median of $\triangle ABD$, $AB > AD$
Prove: $m\angle 1 > m\angle 2$

Statements	Reasons
1. $\overline{AC}$ is median $\triangle ABD$, $AB > AD$	1. Given
2. $\overline{BC} \cong \overline{CD}$	2. def of median
3. $\overline{AC} \cong \overline{AC}$	3. Reflexive Prop of ≅
4. $m\angle 1 > m\angle 2$	4. Converse of Hinge Theorem

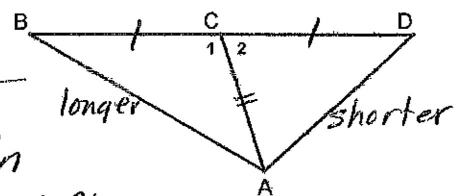


Figure 4

Coordinate proof
Given: $\triangle OEF$ is a right triangle, M is the midpoint of $\overline{EF}$
Prove: EM = FM = OM

Use midpt. formula to find M $\left(\frac{0+2a}{2}, \frac{2b+0}{2}\right)$
M (a, b)

Use distance formula to show EM = FM = OM

$OM = \sqrt{(a-0)^2+(b-0)^2} = \sqrt{a^2+b^2}$

$EM = \sqrt{(a-0)^2+(b-2b)^2} = \sqrt{a^2+b^2}$

$FM = \sqrt{(2a-a)^2+(0-b)^2} = \sqrt{a^2+b^2}$

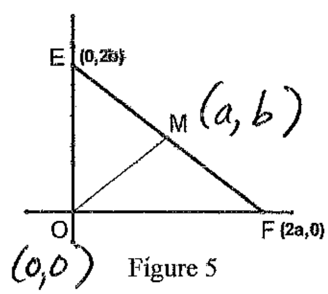


Figure 5

All three sides equal $\sqrt{a^2+b^2}$
∴ EM = FM = OM